IN THE CLAIMS

1. (original) A method for measuring surface characteristics of a substrate having a repeating pattern of integrated circuits, the repeating pattern having a repeat dimension along a first axis, the method including the steps of:

defining an inspection grid of points on the substrate, the inspection grid of points having a spacing along the first axis,

directing an incident beam at the inspection grid of points on the substrate where the spacing of the points along the first axis is a submultiple of the repeat dimension of the repeating pattern along the first axis,

reflecting the incident beam off the substrate to produce a reflected beam,

receiving the reflected beam with a position sensitive detector,

determining an actual landing location of the reflected beam on the position sensitive detector,

measuring a displacement between the actual landing location of the reflected beam from an expected landing location of the reflected beam on the position sensitive detector,

compiling a database of displacement measurements,

examining at least two displacement measurements in the database,

correcting at least one displacement measurement for effects of a pattern induced anomaly in the displacement measurements and producing an adjusted database, and

deriving the surface characteristics of the substrate from the adjusted database.

2. (original) The method of claim 1 wherein the step of correcting at least one displacement measurement for effects of a pattern induced anomaly in the displacement measurements comprises deriving a tilt at a point and subtracting the tilt at that point from the tilt at a comparable point in an adjoining pattern.

3. (original) The method of claim 1 wherein the step of directing an incident beam at the inspection grid of points on the substrate comprises adjusting the incident

beam with a collimating lens such that incident rays are substantially parallel for at least two points on the inspection grid.

4. (original) The method of claim 1 wherein the incident beam is comprised of more than one wavelength.

5. (original) The method of claim 1 wherein the incident beam is multiplexed between two wavelengths.

6. (original) The method of claim 1 wherein the method for directing the incident beam between points on the substrate comprises redirection by a galvo driven mirror.

7. (original) The method of claim 1 wherein the method for directing the incident beam between points on the substrate comprises redirection by an acousto optic modulator.

8. (original) The method of claim 1 wherein the position sensitive detector is a current sharing detector.

9. (currently amended) A method for measuring a topography of a substrate, the method comprising the steps of:

directing an incident beam at an inspection grid of points on the substrate where the points are selected so that a reflected beam from each point in the inspection grid has minimal distortion, wherein the incident beam is multiplexed between two wavelengths~~comprised of more than one wavelength~~,

receiving the reflected beam with a position sensitive detector,

measuring displacements between actual landing locations of the reflected beam and expected landing locations,

deriving the topography of the substrate from the displacement measurements.

10. (original) The method of claim 9 wherein the step of directing an incident beam at the inspection grid of points on the substrate comprises using a collimating lens

such that incident beams are substantially parallel for at least two points on the inspection grid.

11. (canceled).
12. (canceled).

13. (original) The method of claim 9 wherein the method for directing the incident beam between the points on the substrate comprises redirection by a galvo driven mirror.

14. (original) The method of claim 9 wherein the method for directing the incident beam between the points on the substrate comprises redirection by an acousto optic modulator.

15. (original) The method of claim 9 wherein the position sensitive detector is a current sharing detector.

16. (original) An apparatus for detecting a characteristic of a substrate having a repeating pattern, the apparatus comprising:

a beam generator adapted to produce an incident beam along a path,

a scanner adapted to direct the path of the incident beam onto a substrate such that the incident beam strikes the substrate at inspection points on an inspection grid where a spacing of the inspection points along a first axis of the inspection grid is a submultiple of a repeat dimension of the repeating pattern on the substrate along the first axis, thereby producing a reflected beam,

a modulator adapted to cause the incident beam to strike the substrate when the incident beam is directed at one of the inspection points,

a position sensitive detector adapted to produce an electronic signal representing a displacement measurement between an actual landing location of the reflected beam on the position sensitive detector and an expected landing location of the reflected beam on the position sensitive detector,

a controller adapted to collect the displacement measurement, compile a database of displacement measurements, use the repeat dimension of the pattern to

analyze the displacement measurements in the database for pattern induced anomalies in the displacement measurements, selectively correct the displacement measurements when errors due to a pattern induced anomaly exceed a threshold to produce an adjusted database, and output data indicating the characteristic of the substrate.

17. (original) The apparatus of claim 16 further comprising a collimating lens adapted to intercept the incident beam after it passes from the scanner and before the incident beam strikes the substrate.

18. (original) The apparatus of claim 16 wherein the incident beam is comprised of more than one wavelength.

19. (original) The apparatus of claim 16 wherein the incident beam is multiplexed between two wavelengths.

20. (original) The apparatus of claim 16 wherein the position sensitive detector is a current sharing detector.